Agathis loranthifolia

Nurhasybi; Sudrajat, Dede J.

Published in:
Seed Leaflet

Publication date:
2002

Document version
Publisher's PDF, also known as Version of record

SEED LEAFLET

No. 59 January 2002

Agathis loranthifolia R.A. Salisbury

Taxonomy and nomenclature

Family: Araucariaceae
Synonym: *Agathis dammara* L. C. Richard
Vernacular/common names: damar (Indonesia); dayungon (Philippines); kauri (English); kauri pine (Papua New Guinea); damar minyak (trade name).

Distribution and habitat

Native to Papua New Guinea, New Britain, Central Malesia (Maluku, Celebes and Philippines), Kalimantan, Malaya and Sumatra. It is found in sub-humid highlands at 300 - 1200 meter altitude, mean annual rainfall 3000 - 4000 mm and mean annual temperature 25 - 30°C.

It can grow on a variety of soils including podzolized sands (in heath forest), ultrabasic soils, limestone, igneous and sedimentary rocks. The seedling needs shade and growth is slow during the first year. Later, when released from competition from weeds, growth is rapid. The root system is sensitive to lack of oxygen and the species does not tolerate waterlogging.

It is cultivated as a plantation tree and used in enrichment planting and reforestation in various areas within the natural range, especially in Irian Jaya. Outside the natural range, it has been planted intensively in Java.

Uses

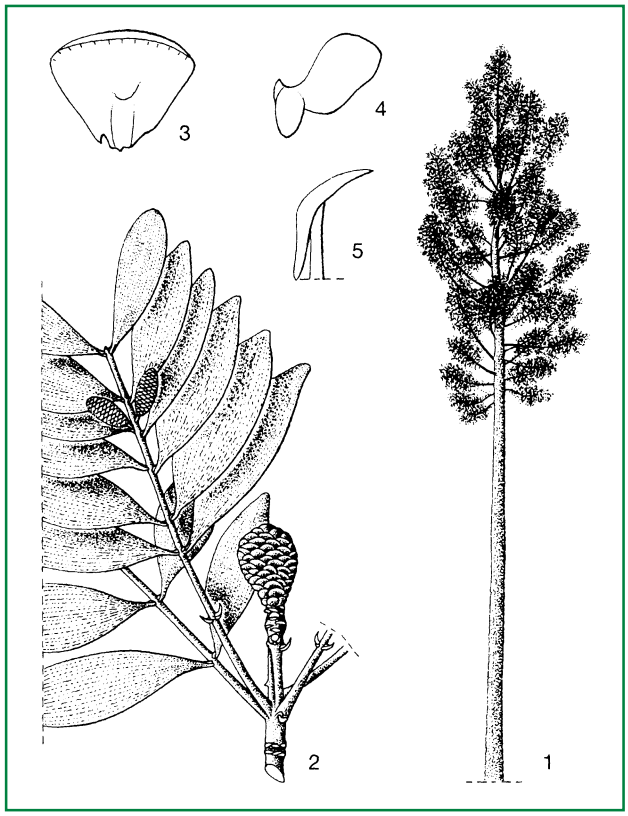
Used for joinery, matches, veneer, packaging, moulding, plywood and pulpwood. The wood is not resistant to rot. The inner bark exudes a translucent and clear white resin, which is called 'copal'. The resin used to be an important component of varnish and was used in the production of linoleum.

Botanical description

A large tree up to 65 m tall with a diameter of up to 200 cm. Bole straight and cylindrical, often swollen at the base or with large, raised superficial roots. Bark light grey to reddish brown, at first quite smooth with conspicuous lenticels, then peeling with large thin irregular flakes that gradually become thicker leaving behind irregular small depressions on larger trees with a somewhat rough reddish brown surface. Adult leaves with solitary resin canals, elliptical, 6-8 cm x 2-3 cm, tapering towards the rounded apex. Female and male cones are on different branches on the same tree. Female cones ellipsoid to globose, 6-8.5 x 5.5-6.5 (- 13) cm; seed scales 30-40 mm long, roughly triangular in shape with a well rounded apical margin. Male cones oblong, straight, ultimately 3-4 cm long, 10 mm across, sessile or with up to 4 mm long peduncles; microsporophylls up to 2 mm across, with rounded apex. Male cones change from light green to brown when they are mature and pollen is released.

Fruit and seed description

Fruit: mature seed cones oval, 9-10.5 cm x 7.5-9.5 cm, seed bracts roughly obtriangular with a small projection near the base on one side. There are 87- 152 scales in one cone, and, in a good season, 88-90 filled seeds per cone.
Seed: flattened, ovoid, with one lateral wing, 10-11 mm x 8 mm. There are 4000-5000 seeds/kg.



1, Tree habit; 2, twig with female and male cones; 3, seed scale; 4, seed; 5, microsporophyll. (Soerianegara and Lemmens, 1994)

Flowering and fruiting habit

In plantations in Java, cone production begins when the tree is about 15 years old, but viable seeds are usually not produced before the age of 25. Trees produce flowers and fruits throughout the year. The best fruiting season occurs from August to October when the highest percentage of filled seed is found in the cone. The species is wind pollinated.

Harvesting

Cones are collected when they have ripened and become brownish-green. They are collected by climbing the tree. It is not easy to collect the cones, as they are produced in upper parts of the crown. It is not recommended to collect seed from the ground.

Processing and handling

Mature cones are placed in porous gunny bags for 1-2 days. The seed will then be released from the cone and from inert matter. Seed cleaning to separate seed from other parts of cone (scales, twigs) is done manually, in a tumbler or in a seed blower.

Storage and viability

The seed does not tolerate desiccation and cannot be stored for much more than 2 months in an air conditioned room (temperature 18-20°C; RH 60%) at moisture content of 30%.

Dormancy and pretreatment

The seed has no dormancy and does not need pretreatment before sowing.

Sowing and germination

Sowing is done with the wing part pointing upwards and 2/3 of the seed buried in the media. Soil or soil mixed with sand is used as germination medium in the green house. Germination starts 6 days after sowing, and germination percentage of 90-100 % is reached within 10 days.

Vegetative propagation is done by stem cutting from seedlings aged 7 months (30 cm tall) dipped in IBA (10 ppm).

River sand is used as medium in rooting bed at a temperature of 28–32°C and relative humidity of 90-100%. Roots will emerge 6-8 weeks after the stem cutting has been placed in the rooting bed.

Selected readings

Komar, T.E. and Nurhasybi. 1996. *Struktur dan Perkembangan Cone Agathis loranthifolia Salisb.* Buletin Teknologi Perbenihan (3(2)). Balai Teknologi Perbenihan. Bogor.

Nurhasybi. 2000. *Damar (Agathis loranthifoia Salis.)* Dalam Atlas Benih Tanaman Hutan Indonesia. Jilid I. Balai Teknologi Perbenihan. Bogor.

Smits, M. 1983. *Vegetative propagation of Shorea of obtusa and Agathis dammara by means of leaf cutting and stem cuttings*. The Malayan Forester, April 1983. Malaysia.

Soerianegara, I. and R.H.M.J. Lemmens (eds). 1994. *Timber Trees: Major Commercial Timbers*. Plant Resources of South-East Asia No. 5 (1). PROSEA. Bogor, Indonesia.

Wadsworth, F.H. 1997. *Forest Production for Tropical America.* Agriculture Handbook No. 710. USDA. Rio Piedras.

Whitmore, T.C. 1977. *A first look at Agathis.* Tropical Forestry Papers No. 11. Unit of Tropical Silviculture. Commonwealth Forestry Institute. University of Oxford.

Agathis loranthifolia stand at Gunung Walat, Sukabumi, West Java, Indonesia. Photo: Nurhasybi, Seed Technology Centre, Bogor, Indonesia.

THIS NOTE WAS PREPARED IN COLLABORATION WITH SEED TECHNOLOGY CENTRE, BOGOR, INDONESIA

Authors: Nurhasybi and Dede J. Sudrajat

Danida Forest Seed Centre	Phone: +45-49190500
Krogerupvej 21	Fax: +45-49160258
DK-3050 Humlebaek	Email: dfsc@sns.dk
Denmark	Website: www.dfsc.dk